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sufficient for all the various purposes to which fire is applied throughout Europe. The object of the above patent is worthy of every encouragement, tending, as it does, to employ beneficially some of this now wasted heat. Mr. Cook, the author of the foregoing paper, has made some calculations on the benefit which the use of gas lights would be in the above respects, of applying beneficially the waste of the coke manufacture, or in other words, of making coke so as to employ all the products of the coal, from whence it appears that the greatest part of the coke wanted in the iron founderies and in other businesses might be supplied in this way. The consumption of coal in the various manufactures of these kingdoms is so prodigious, that serious apprehensions have been entertained of the supply falling short, at some future period. Mr. Davy, the chemist and mineralogist, has made calculations of the extent of the coal beds of England, which show that these apprehensions are fallacious; but still this should not encourage waste, for it is evident that as the coal beds are worked deeper the expense of raising the coals must be increased; and that the present great waste of them may therefore in time raise the price to an inconvenient height, though it may not be sufficient to cause an absolute scarcity.

Patent of Mr. Charles Seward of Lancaster, Tin-plate Worker; for a new improved Burner and Lantern head, for Street and other Lamps.

Dated July, 1809.

The head of Mr. Seward's lamp is rather flatter than ordinary, and through its centre a tube, about ten inches long and three in diameter, passes down to within two inches of the burner; the upper end of this pipe is covered by a scolloped cap, of a conical form, to exclude the wind and rain, while it allows the smoke to escape through its apertures. The rim of the cover, where it joins the glass globe (which is of the usual form) is pierced all round with a number of holes, for the admission of air; the cover shuts down over an inner rim, that is attached to the glass, but which does not rise quite so high as the cover, and being made to slope a little in-

wards, admits the air to pass freely between it and the outward rim, while it excludes the wind and rain; to render which purpose more effectual the holes in the outward rim are placed lower than the top of the inner rim. The reservoir for the oil is made very shallow, about three quarters of an inch deep, in order that the oil may be always near the flame, and have as little as possible to ascend up the wick. It is also of importance that the reservoir be made no larger than to contain a sufficient quantity of oil for each time of burning: it is therefore recommended that these reservoirs be made of different sizes, according to the different length of time they are required to burn; this reservoir is covered, and a part projects from it of a tubular form which contains the wick; this part is an eighth of an inch deeper than the reservoir, and the oil is also poured in through it. The wick is contained in a moveable flat tube, which reaches quite down to the bottom of the reservoir, and has notches cut in it below to admit the oil. This form of the wick tube admits of its being made very wide without the wick being liable to slide down and extinguish the light; the width of this tube should not be less than a sixth of an inch. A wide tube is necessary to make a lamp burn well with common oil, and by reaching low down, the oil is warmed and prevented from coagulating. The wick tube is soldered to a small round piece of tin, the edge of which rests on a shoulder on the inside of the projecting part, and then lies in a level with the top of the reservoir. The wick tube should not rise above an eighth of an inch above this tin plate, and its top will then be on a level with that of the projecting part.

The reservoir is suspended by wires so that the flame shall be just under the centre of the smoke tube. The wick is of the broad flat kind, called garter or ribband wick, and is prepared by soaking it in tallow, and pressing out the superfluous grease, which causes it to burn more clearly and to last longer. It is then cut into pieces, a quarter of an inch longer than the wick tube; which being stiff with the tallow, are easily put into the top of the wick tubes.

Observations... This lamp is contrived on good principles; and the directions, being explanatory of the best mode of managing street lamps in general, in several useful, though minute particulars are inserted at length.

The beneficial use of the smoke tube has been long since proved in Argand's lamps; in lanterns for passages, it would be best to have these tubes of glass, as tin ones would intercept the light too much; but for street lamps, this is no object, as they are placed so high, that the descending rays are alone of any material consequence; some of these nowever would be interrupted by the great breadth of the reservoirs, directed in Mr. Seward's lamps, and this is the chief defect they have.

But it is probable before long, that gas lights will be alone used for lighting streets, as they are so much cheaper and more brilliant than any common lamps. The experiments in lighting the whole of Pall Mall, and some other parts of London with these gas lights, prove this in a very satisfactory manner. We are promised some communications from Mr. Cook of Birmingham on this interesting subject, which we hope to have in time for our next number.

Mr. Seward's lamps have, however, considerable merit for common use; and we are more inclined to recommend them, in hopes of their superseding those glaring glasses, of a lenticular shape, which have of late years come so much into use, in street lamps; which by throwing the light strongly in one direction, have caused a deceptive appearance of encreasing it, when in fact they really diminish the sum of that which falls on the street; and cause the light to be so unequally distributed, as to produce the most disagreeable effect on even the strongest eyes, and a very injurious one on those which are weak, by causing such abrupt transitions from intense light to comparative darkness, as renders the beautiful mechanism of the iris (placed in our eyes purposely to prevent the ill effects of such changes) of no use; as it cannot open and close sufficiently quick for the occasion.

BELFAST MAG. NO. XV.

On a Report on Natural and Artificial Puzzolano of M. Gratian Lepere, Engineer of Roads and Bridges to the French Institute, by M. Chaptal.

Annales de Chimie, tome 64. p. 278.

A substitute for puzzolano may be procured in three ways: 1st, by employing the remains of this kind of the extinguished volcanoes, which almost all countries produce: 2dly, by substituting some other volcanic products for puzzolano: 3dly, by giving to certain mineral substances, by calcination, all the properties of these volcanic productions.

Messrs. Desmarests and Faujas St. Fond, long ago made known some strata of good puzzolano, in the extinguished volcanoes of Auvergne and Vivarais; I also pointed out this substance in the volcanoes which separate Lodeve from Bedarieux, in the department of the Herault, and it has been employed with success in the construction of bridges and other aquatic buildings.

We may find a substitute for puzzolano in other volcanic products, such as basalt, pumice stones, &c. carefully pounded.

In 1807 M. Guyton de Morveau sent to M. de Cessart at Cherbourg, some calcined basalts, from the extinguished volcano of Drevin, in the department of the Var and Loire.—The latter proved by conclusive experiments, that they might be employed with great advantage in buildings under water.

The Dutch tarrass is a kind of pumice stone brought from Bonn and Andernach. At Dordrecht, at the mouths of the Rhine and Meuse the operation of pounding is effected.

But these resources are local, and that the manufacture of puzzolano may become general, we proceed to describe the best means of attaining it.

It would be difficult to assign the period at which pounded bricks, and the earthy residue from the distillation of aquafortis, has been substituted for volcanic puzzolano. Their use, however, has become general, particularly where there are no sea-ports in the vicinity, at which real puzzolano can be furnished; even in the south of France they prefer the

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